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☑ Final Report
☐ Revised Report

Report Date:
24-May-17 11:45

Laboratory Report
SC34648

Gulf Oil L.P.
281 Eastern Avenue
Chelsea, MA 02150
Attn: Andrew P. Adams

Project: Gulf Terminal - Chelsea, MA
Project #: Gulf Chelsea

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87936
Maine # MA138
New Hampshire # 2972/2538
New Jersey # MA011
New York # 11393
Pennsylvania # 68-04426/68-02924
Rhode Island # LAO00348
USDA # P330-15-00375
Vermont # VT-11393

Authorized by:

Christina White
Laboratory Director

Eurofins Spectrum Analytical holds primary certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 12 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Eurofins Spectrum Analytical, Inc.

Eurofins Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Eurofins Spectrum Analytical, Inc. is currently accredited for the specific method or analyte indicated. Please refer to our 'Quality' web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Eurofins Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (PA-68-04426).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

Sample Summary

Work Order: SC34648

Project: Gulf Terminal - Chelsea, MA

Project Number: Gulf Chelsea

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SC34648-01	Outfall 003	Surface Water	13-May-17 21:00	15-May-17 14:05

CASE NARRATIVE:

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

All non-detects and all results below the reporting limit are reported as "<" (less than) the reporting limit in this report.

The samples were received 3.8 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

Analyses for Total Hardness, pH, and Total Residual Chlorine fall under the state of Pennsylvania code Chapter 252.6 accreditation by rule.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

SW846 8260C

Calibration:

1705009

Analyte quantified by quadratic equation type calibration.

Naphthalene

This affected the following samples:

1708138-BLK1
1708138-BLK2
1708138-BS1
1708138-BS2
1708138-BSD1
1708138-BSD2
Outfall 003
S704360-ICV1
S704555-CCV1

Laboratory Control Samples:

1708138-BS1

LCS/LCSD were analyzed in place of MS/MSD.

1708138-BSD1

LCS/LCSD were analyzed in place of MS/MSD.

SW846 8270D SIM

Calibration:

1704025

Analyte quantified by quadratic equation type calibration.

Benzo (a) pyrene
Benzo (e) pyrene-d12

SW846 8270D SIM

Calibration:

1704025

This affected the following samples:

1708203-BLK2
1708203-BS2
1708203-BSD2
Outfall 003
S703654-ICV1
S704678-CCV1
S704750-CCV1

Laboratory Control Samples:

1708203 BSD

Benzo (a) pyrene RPD 25% (20%) is outside individual acceptance criteria.

Naphthalene RPD 21% (20%) is outside individual acceptance criteria.

1708203-BSD2

RPD out of acceptance range. The batch is accepted based upon LCS and/or LCSD recovery.

Benzo (a) pyrene
Naphthalene
Phenanthrene
Pyrene

Sample Acceptance Check Form

Client:	Gulf Oil L.P.
Project:	Gulf Terminal - Chelsea, MA / Gulf Chelsea
Work Order:	SC34648
Sample(s) received on:	5/15/2017

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
Were custody seals present?	☐	☑	☐
Were custody seals intact?	☐	☐	☑
Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
Were samples refrigerated upon transfer to laboratory representative?	☑	☐	☐
Were sample containers received intact?	☑	☐	☐
Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
Were samples accompanied by a Chain of Custody document?	☑	☐	☐
Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☑	☐	☐
Did sample container labels agree with Chain of Custody document?	☑	☐	☐
Were samples received within method-specific holding times?	☑	☐	☐

Summary of Hits

Lab ID: SC34648-01 **Client ID:** Outfall 003

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Total Suspended Solids	9.8		1.0	mg/l	SM2540D (11)
Naphthalene	0.076		0.051	µg/l	SW846 8270D SIM

Please note that because there are no reporting limits associated with hazardous waste characterizations or micro analyses, this summary does not include hits from these analyses if included in this work order.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
Outfall 003	Gulf Chelsea	Surface Water	13-May-17 21:00	15-May-17
SC34648-01				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Volatile Organic Compounds													
Volatile Organic Aromatics by SW846 8260 Prepared by method SW846 5030 Water MS													
71-43-2	Benzene	< 1.0		µg/l	1.0	0.3	1	SW846 8260C	16-May-17	17-May-17	GMA	1708138	
91-20-3	Naphthalene	< 1.0		µg/l	1.0	0.4	1	"	"	"	"	"	
Surrogate recoveries:													
460-00-4	*4-Bromofluorobenzene*	*96*			*70-130 %*			"	"	"	"	"	
2037-26-5	*Toluene-d8*	*98*			*70-130 %*			"	"	"	"	"	
17060-07-0	*1,2-Dichloroethane-d4*	*102*			*70-130 %*			"	"	"	"	"	
1868-53-7	*Dibromofluoromethane*	*98*			*70-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM Prepared by method SW846 3510C													
50-32-8	Benzo (a) pyrene	< 0.051		µg/l	0.051	0.006	1	SW846 8270D SIM	17-May-17	22-May-17	MSL	1708203	
91-20-3	Naphthalene	**0.076**		µg/l	0.051	0.007	1	"	"	"	"	"	
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*69*			*30-130 %*			"	"	"	"	"	
Extractable Petroleum Hydrocarbons Prepared by method SW846 3510C													
	Oil & Grease	< 1.00		mg/l	1.00	0.915	1	EPA 1664B	22-May-17	22-May-17	KK	1708456	X
General Chemistry Parameters													
	pH	**9.16**		pH Units			1	ASTM D 1293-99B	15-May-17 18:00	15-May-17 18:20	BD	1708122	X
	Total Suspended Solids	**9.8**		mg/l	1.0	0.4	1	SM2540D (11)	16-May-17	17-May-17	CMB	1708147	X

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1708138 - SW846 5030 Water MS										
Blank (1708138-BLK1)						Prepared & Analyzed: 16-May-17				
Benzene	< 1.0		µg/l	1.0						
Naphthalene	< 1.0		µg/l	1.0						
Surrogate: 4-Bromofluorobenzene	*47.2*		µg/l		*50.0*		*94*	*70-130*		
Surrogate: Toluene-d8	*48.1*		µg/l		*50.0*		*96*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*50.8*		µg/l		*50.0*		*102*	*70-130*		
Surrogate: Dibromofluoromethane	*48.0*		µg/l		*50.0*		*96*	*70-130*		
Blank (1708138-BLK2)						Prepared & Analyzed: 16-May-17				
Benzene	< 5.0	D	µg/l	5.0						
Naphthalene	< 5.0	D	µg/l	5.0						
Surrogate: 4-Bromofluorobenzene	*46.5*		µg/l		*50.0*		*93*	*70-130*		
Surrogate: Toluene-d8	*48.1*		µg/l		*50.0*		*96*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*51.5*		µg/l		*50.0*		*103*	*70-130*		
Surrogate: Dibromofluoromethane	*48.4*		µg/l		*50.0*		*97*	*70-130*		
LCS (1708138-BS1)		QM10				Prepared & Analyzed: 16-May-17				
Benzene	**19.3**		µg/l		20.0		97	70-130		
Naphthalene	**22.1**		µg/l		20.0		110	70-130		
Surrogate: 4-Bromofluorobenzene	*49.0*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: Toluene-d8	*48.7*		µg/l		*50.0*		*97*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*49.6*		µg/l		*50.0*		*99*	*70-130*		
Surrogate: Dibromofluoromethane	*48.0*		µg/l		*50.0*		*96*	*70-130*		
LCS (1708138-BS2)						Prepared: 16-May-17 Analyzed: 17-May-17				
Benzene	**20.6**	D	µg/l		20.0		103	70-130		
Naphthalene	**24.1**	D	µg/l		20.0		121	70-130		
Surrogate: 4-Bromofluorobenzene	*48.6*		µg/l		*50.0*		*97*	*70-130*		
Surrogate: Toluene-d8	*49.2*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*49.5*		µg/l		*50.0*		*99*	*70-130*		
Surrogate: Dibromofluoromethane	*48.3*		µg/l		*50.0*		*97*	*70-130*		
LCS Dup (1708138-BSD1)		QM10				Prepared & Analyzed: 16-May-17				
Benzene	**21.1**		µg/l		20.0		105	70-130	9	20
Naphthalene	**23.4**		µg/l		20.0		117	70-130	6	20
Surrogate: 4-Bromofluorobenzene	*48.8*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: Toluene-d8	*48.8*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*49.8*		µg/l		*50.0*		*100*	*70-130*		
Surrogate: Dibromofluoromethane	*47.5*		µg/l		*50.0*		*95*	*70-130*		
LCS Dup (1708138-BSD2)						Prepared: 16-May-17 Analyzed: 17-May-17				
Benzene	**19.8**	D	µg/l		20.0		99	70-130	4	20
Naphthalene	**23.9**	D	µg/l		20.0		119	70-130	0.9	20
Surrogate: 4-Bromofluorobenzene	*49.0*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: Toluene-d8	*49.1*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*48.9*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: Dibromofluoromethane	*48.0*		µg/l		*50.0*		*96*	*70-130*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8270D SIM										
Batch 1708203 - SW846 3510C										
Blank (1708203-BLK2)						Prepared: 17-May-17 Analyzed: 18-May-17				
Benzo (a) pyrene	< 0.050		µg/l	0.050						
Naphthalene	< 0.050		µg/l	0.050						
Phenanthrene	< 0.050		µg/l	0.050						
Pyrene	< 0.050		µg/l	0.050						
Surrogate: Benzo (e) pyrene-d12	*0.780*		µg/l		*1.00*		*78*	*30-130*		
LCS (1708203-BS2)						Prepared: 17-May-17 Analyzed: 18-May-17				
Benzo (a) pyrene	**0.721**		µg/l	0.050	1.00		72	40-140		
Naphthalene	**0.741**		µg/l	0.050	1.00		74	40-140		
Phenanthrene	**0.643**		µg/l	0.050	1.00		64	40-140		
Pyrene	**0.749**		µg/l	0.050	1.00		75	40-140		
Surrogate: Benzo (e) pyrene-d12	*0.800*		µg/l		*1.00*		*80*	*30-130*		
LCS Dup (1708203-BSD2)						Prepared: 17-May-17 Analyzed: 18-May-17				
Benzo (a) pyrene	**0.929**	QR9	µg/l	0.050	1.00		93	40-140	25	20
Naphthalene	**0.916**	QR9	µg/l	0.050	1.00		92	40-140	21	20
Phenanthrene	**0.826**	QR9	µg/l	0.050	1.00		83	40-140	25	20
Pyrene	**0.977**	QR9	µg/l	0.050	1.00		98	40-140	26	20
Surrogate: Benzo (e) pyrene-d12	*0.990*		µg/l		*1.00*		*99*	*30-130*		

Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
EPA 1664B										
Batch 1708456 - SW846 3510C										
Blank (1708456-BLK1)							Prepared & Analyzed: 22-May-17			
Oil & Grease	< 1.00		mg/l	1.00						
LCS (1708456-BS1)							Prepared & Analyzed: 22-May-17			
Oil & Grease	**13.4**		mg/l	1.00	16.5		81	78-114		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
ASTM D 1293-99B										
Batch 1708122 - General Preparation										
Duplicate (1708122-DUP1)			**Source: SC34648-01**			Prepared & Analyzed: 15-May-17				
pH	**9.16**		pH Units			9.16			0	5
Reference (1708122-SRM1)						Prepared & Analyzed: 15-May-17				
pH	**6.01**		pH Units		6.00		100	97.5-102.5		
Reference (1708122-SRM2)						Prepared & Analyzed: 15-May-17				
pH	**6.02**		pH Units		6.00		100	97.5-102.5		
SM2540D (11)										
Batch 1708147 - General Preparation										
Blank (1708147-BLK1)						Prepared: 16-May-17 Analyzed: 17-May-17				
Total Suspended Solids	< 0.5		mg/l	0.5						
LCS (1708147-BS1)						Prepared: 16-May-17 Analyzed: 17-May-17				
Total Suspended Solids	**98.0**		mg/l	10.0	100		98	90-110		

Notes and Definitions

D	Data reported from a dilution
QM10	LCS/LCSD were analyzed in place of MS/MSD.
QR9	RPD out of acceptance range. The batch is accepted based upon LCS and/or LCSD recovery.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference
OG	The required Matrix Spike and Matrix Spike Duplicate (MS/MSD) for Oil & Grease method 1664B can only be analyzed when the client has submitted sufficient sample volume. An extra liter per MS/MSD is required to fulfill the method QC criteria. Please refer to Chain of Custody and QC Summary (MS/MSD) of the Laboratory Report to verify ample sample volume was submitted to fulfill the requirement.
pH	The method for pH does not stipulate a specific holding time other than to state that the samples should be analyzed as soon as possible. For aqueous samples the 40 CFR 136 specifies a holding time of 15 minutes from sampling to analysis. Therefore all aqueous pH samples not analyzed in the field are considered out of hold time at the time of sample receipt. All soil samples are analyzed as soon as possible after sample receipt.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

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SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

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Special Handling:

☑ Standard TAT - 7 to 10 business days

☐ Rush TAT - Date Needed: _____

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed.

Report To: Andrew Adams
Gulf Oil LP
281 Eastern Ave
Chelsea, MA 02150
Telephone #: 617.884.5980
Project Mgr: Andrew Adams

Invoice To: Christopher Gill
Gulf Oil LP
80 William St, Suite 400
Wellesley, MA 02481-3705
P.O No.: _____ Quote/RQN: _____

Project No: Gulf Chelsea
Site Name: Gulf Chelsea Terminal
Location: 281 Eastern Ave, Chelsea State: MA
Sampler(s): [redacted] Andrew Adams

F=Field Filtered 1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11= none 12= _____

DW=Dinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1= _____ X2= _____ X3= _____

G= Grab C=Compsite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: TSS, pH	O&G	VOCs (benzene & naphthalene)	PAH (benz(a) pyrene & naphthalene)	Check if chlorinated
SC34648-1	Outfall 003	5-13-17	2106	G	SW				1	X				☐
	Outfall 003	5-13-17	2100	G	SW		1				X			☐
	Outfall 003	5-13-17	2100	G	SW	3						X		☐
	Outfall 003	5-13-17	2100	G	SW		1						X	☐
														☐
														☐
														☐
														☐
														☐
														☐

List Preservative Code below: 11 | 3 | 2 | 11

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? ☐ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☑ Standard ☐ No QC ☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☐ Other: _____
State-specific reporting standards:

Required MLs:
benzene 2 µg/L
naphthalene 5 µg/L
benzo(a)pyrene 0.1 µg/L

Relinquished by:	Received by:	Date:	Time:
		5/15/17	10:40
		5-15-17	1405

Temp °C: Observed 3.8 | Correction Factor 0 | Corrected 3.8 | IR ID # 02

☐ EDD format: _____
☑ E-mail to: aadams@gulfoil.com, cgill@gulfoil.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☐ Iced ☑ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

Batch Summary

1708122

General Chemistry Parameters

1708122-DUP1
1708122-SRM1
1708122-SRM2
SC34648-01 (Outfall 003)

1708138

Volatile Organic Compounds

1708138-BLK1
1708138-BLK2
1708138-BS1
1708138-BS2
1708138-BSD1
1708138-BSD2
SC34648-01 (Outfall 003)

1708147

General Chemistry Parameters

1708147-BLK1
1708147-BS1
SC34648-01 (Outfall 003)

1708203

Semivolatile Organic Compounds by GCMS

1708203-BLK2
1708203-BS2
1708203-BSD2
SC34648-01 (Outfall 003)

1708456

Extractable Petroleum Hydrocarbons

1708456-BLK1
1708456-BS1
SC34648-01 (Outfall 003)

S703654

Semivolatile Organic Compounds by GCMS

S703654-CAL1
S703654-CAL2
S703654-CAL3
S703654-CAL4
S703654-CAL5
S703654-CAL6
S703654-CAL7
S703654-CAL8
S703654-CAL9
S703654-CALA
S703654-CALB
S703654-ICV1
S703654-LCV1
S703654-LCV2
S703654-TUN1

S704360

Volatile Organic Compounds

S704360-CAL1
S704360-CAL2
S704360-CAL3
S704360-CAL4
S704360-CAL5
S704360-CAL6
S704360-CAL7
S704360-CAL8
S704360-CAL9
S704360-CALA
S704360-CALB
S704360-ICV1
S704360-LCV1
S704360-LCV2
S704360-LCV3
S704360-LCV4
S704360-TUN1

S704555

Volatile Organic Compounds

S704555-CCV1
S704555-TUN1

S704678

Semivolatile Organic Compounds by GCMS

S704678-CCV1
S704678-TUN1

S704750

Semivolatile Organic Compounds by GCMS

S704750-CCV1
S704750-TUN1